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ABSTRACT*of the Disclosure*

A gravity meter has a portable housing for holding a corner cube retroreflector that can be dropped within the housing. The housing also holds a laser and an optical fiber having a first end in light communication with the laser. Additionally, the fiber has a second end which terminates at a ferrule. Light from the laser propagates through the optical fiber, and a portion of the light is reflected by the second end of the fiber back through the optical fiber to a beam splitter, while another portion of the light propagates through the second end of the fiber and is reflected by the falling corner cube back through the fiber to the beam splitter. The two reflected portions of the laser light interfere with each other to generate an interference fringe pattern which is extracted by the beam splitter. Data points representing the fringe pattern are extracted at a constant sampling frequency, and a non-linear least squares fit is used to iteratively fit the data points to a sinusoidal function representative of the fringe pattern to determine the acceleration of the corner cube (and, hence, the gravitational acceleration).